APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,789	10/17/2003	Gaurav Singh	RAZA-04900	9869

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EXAMINER
BELL, LOUIS W

ART UNIT	PAPER NUMBER
2616	

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11/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

		Application No.	Applicant(s)
Office Action Summary		10/687,789	SINGH ET AL.
		Examiner	Art Unit	
		Louis Bell	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>17 October 2003</u>.

2a) ☐ This action is **FINAL.**   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-20* is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-20* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>17 October 2003</u> is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a) ☐ All   b) ☐ Some *   c) ☐ None of:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____.

        3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
     Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
     Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. This is a Non-Final Office Action in response to the present US Application filed on

10/17/2003. **Claims 1-20** are presented for examination. No Claims are withdrawn.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3.   **Claim 1, 2, 3, 4, 6, 7, 9, 10, 11, 12, 16, 17, 18 and 20** are rejected under 35

U.S.C. 103(a) as being unpatentable over Patent No.: US 6,907,469 B1 to Gallo et al.

"Gallo" in view of Pub.: No.: US 2003/0152075 A1 to Hawthorne III *et al.*, "Hawthorne".

As to **claim 1** Gallo discloses a configurable lookup table system, comprising: a

first controller coupled to a first lookup table, wherein the first controller configures the

first lookup table for a first type lookup (*fig. 2 shows a network processor implementing

a logical bridge with instruction to implement layer 2, L2, lookup, col. 2 lines 65-67, col.

3 lines 1-3*); and a second controller coupled to a second lookup table, wherein: (a) in a

first mode, the second controller configures the second lookup table for a second type

lookup (*fig. 2 shows a network processor implementing a logical router with instruction

to implement layer 3, L3, lookup, col. 3 lines 30-34*);

Gallo does not expressly disclose the second controller configures the second lookup table for the first type lookup;

Hawthorne discloses a device comprising of two L2 controllers and two L2 tables: a hardware-based L2 forwarding table couple to L2 forwarding engine and a software-based L2 forwarding table couple to a L2 learning engine, these to tables contain L2 entries such as source address MAC (SA MAC), destination address MAC (DA MAC), VLAN ID (fig. 4 pg. 4 paragraph. 52, 54, pg. 5 paragraph. 56);

Gallo and Hawthorne are analogous art because they are from the same field of endeavor with respect to techniques for forwarding traffic in a packet-based network;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Gallo and Hawthorne with motivations such as to perform faster database look-ups (Gallo, col. 4 lines 30-31).

As to **claim 2** Gallo and Hawthorne disclose the configurable lookup table system of claim 1;

Gallo further discloses the first type lookup includes a Layer 2 lookup (col. 3 lines 1-3).

As to **claim 3** Gallo and Hawthorne disclose the configurable lookup table system of claim 2;

Gallo further discloses the Layer 2 lookup includes a Media Access Control (MAC) address lookup (col. 3 lines 11-14).

As to **claim 4** Gallo and Hawthorne disclose the configurable lookup table system of claim 1;

Gallo further discloses the second type lookup includes a Layer 3 lookup (col. 4 lines 3-5).

As to **claim 6** Gallo and Hawthorne disclose the configurable lookup table system of claim 1;

Gallo does not expressly disclose a lookup in the second mode includes: (a) a first level in the second lookup table; and (b) a second level in the first lookup table.

Hawthorne discloses that when VLAN ID translation rules are programmed into the hardware-based L2 forwarding table, the output VLAN ID and an output port can be obtained from this table and thus the packet can be forwarded; however, when VLAN ID translation rules are not programmed into the hardware-based L2 forwarding table, then, the software-base L2 table is used to forward the packet to the output port (pg. 5 paragraph 59-60);

Gallo and Hawthorne are analogous art because they are from the same field of endeavor with respect to techniques for forwarding traffic in a packet-based network;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Gallo and Hawthorne with motivations such as to perform faster database look-ups (Gallo, col. 4 lines 30-31).

As to **claim 7** Gallo and Hawthorne disclose the configurable lookup table system of claim 6;

Gallo does not expressly disclose the second level in the first lookup table is configured: (a) to be performed if a miss indication from the first level in the second

lookup table; and (b) to not be performed if a hit indication from the first level in the second lookup table.

Hawthorne discloses that the software-based L2 forwarding table will be used to forward a packet when there is a "miss" in the in the lookup of the hardware-based L2 forwarding table, if the information to forward the packet is found in the hardware-based L2 forwarding table then the software-based L2 forwarding table is not needed in order to forward the packet (pg. 5 paragraph 59-60);

Gallo and Hawthorne are analogous art because they are from the same field of endeavor with respect to techniques for forwarding traffic in a packet-based network;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Gallo and Hawthorne with motivations such as to perform faster database look-ups (Gallo, col. 4 lines 30-31).

As to **claim 9** Gallo discloses a method of controlling a lookup table system, comprising: determining a first mode or a second mode (*a look-up in the destination address of the frame will determine if the frames needs L3 processing by the logical router, col. 3 lines 26-29*); and when in a first mode: (a) using a first lookup table for a first type lookup (*fig. 2 shows a network processor implementing a logical bridge with instruction to L2 lookup, col. 2 lines 65-67, col. 3 lines 1-3*); and (b) using a second lookup table for a second type lookup (*fig. 2 shows a network processor implementing a logical router with instruction to implement L3 lookup, col. 3 lines 30-34*);

Gallo does not expressly disclose when in a second mode: (a) splitting the first

type lookup into a first level and a second level; (b) using the second lookup table for

the first level; and (c) using the first lookup table for the second level;

Hawthorne discloses a device that uses two layer 2 tables to forward packets: a

hardware-based L2 forwarding table and a software-based L2 forwarding table, if the

VLAN ID translation rule is programmed in the hardware-based L2 forwarding table, the

traffic is forwarded using this table; if the VLAN ID translation rule is not programmed in

the hardware-based L2 forwarding table, traffic is forwarded using the software-base L2

forwarding table (pg. 5 paragraph. 59-60);

Gallo and Hawthorne are analogous art because they are from the same field of

endeavor with respect to techniques for forwarding traffic in a packet-based network;

At the time of the invention, it would have been obvious to a person of ordinary

skilled in the art to combine the teachings of Gallo and Hawthorne with motivations such

as to perform faster database look-ups (Gallo, col. 4 lines 30-31).

As to **claim 10** Gallo and Hawthorne disclose the method of controlling the

lookup table system of claim 9;

Gallo further discloses the first type lookup includes a Layer 2 lookup (col. 3 lines

1-3).

As to **claim 11** Gallo and Hawthorne disclose the method of controlling the

lookup table system of claim 10;

Gallo further discloses the Layer 2 lookup includes a Media Access Control

(MAC) address lookup (col. 3 lines 11-14).

As to **claim 12** Gallo and Hawthorne disclose the method of controlling the lookup table system of claim 9;

Gallo further discloses the second type lookup includes a Layer 3 lookup (col. 4 lines 3-5).

As to **claim 16** Gallo and Hawthorne disclose the method of controlling the lookup table system of claim 9;

Gallo does not expressly disclose the splitting the first type lookup into the first level and the second level includes configuring for a serial operation.

Hawthorne disclose serial operation of the hardware-based L2 forwarding table and the software-based L2 forwarding table since the software-based L2 forwarding table is used after there is a L2 miss lookup in the hardware-based L2 forwarding table (pg. 5 paragraph. 60);

· Gallo and Hawthorne are analogous art because they are from the same field of endeavor with respect to techniques for forwarding traffic in a packet-based network;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Gallo and Hawthorne with motivations such as to perform faster database look-ups (Gallo, col. 4 lines 30-31).

As to **claim 17** Gallo and Hawthorne disclose the method of controlling the lookup table system of claim 16;

Gallo does not expressly disclose the using the first lookup table for the second level is dependent on a miss indication from the using the second lookup table for the first level;

Hawthorne disclose using the software-based L2 forwarding table when there is a L2 miss in the hardware-based L2 forwarding table (pg. 5 paragraph. 60);

Gallo and Hawthorne are analogous art because they are from the same field of endeavor with respect to techniques for forwarding traffic in a packet-based network;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Gallo and Hawthorne with motivations such as to perform faster database look-ups (Gallo, col. 4 lines 30-31).

As to **claim 18** Gallo discloses a means for controlling a lookup table comprising: a means for determining a first mode or a second mode (*a look-up in the destination address of the frame will determine if the frames needs L3 processing by the logical router, col. 3 lines 26-29*); when in a first mode: (a) a means for using a first lookup table for a first type lookup (*fig. 2 shows a network processor implementing a logical bridge with instruction to L2 lookup, col. 2 lines 65-67, col. 3 lines 1-3*); and (b) a means for using a second lookup table for a second type lookup (*fig. 2 shows a network processor implementing a logical router with instruction to implement L3 lookup, col. 3 lines 30-34*);

Gallo does not expressly disclose when in a second mode: (a) a means for splitting the first type lookup into a first level and a second level; (b) a means for using the second lookup table for the first level; and (c) a means for using the first lookup table for the second level;

Hawthorne discloses a device that uses two layer 2 tables to forward packets: a hardware-based L2 forwarding table and a software-based L2 forwarding table, if the

VLAN ID translation rule is programmed in the hardware-based L2 forwarding table, the traffic is forwarded using this table; if the VLAN ID translation rule is not programmed in the hardware-based L2 forwarding table, traffic is forwarded using the software-base L2 forwarding table (pg. 5 paragraph. 59-60);

Gallo and Hawthorne are analogous art because they are from the same field of endeavor with respect to techniques for forwarding traffic in a packet-based network;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Gallo and Hawthorne with motivations such as to perform faster database look-ups (Gallo, col. 4 lines 30-31).

As to **claim 20** Gallo and Hawthorne disclose the means for controlling the lookup table of claim 18;

Gallo does not expressly disclose the means for splitting the first type lookup into the first level and the second level includes means for configuring for a serial operation;

Hawthorne disclose serial operation of the hardware-based L2 forwarding table and the software-based L2 forwarding table since the software-based L2 forwarding table is used after there is a L2 miss lookup in the hardware-based L2 forwarding table (pg. 5 paragraph. 60);

Gallo and Hawthorne are analogous art because they are from the same field of endeavor with respect to techniques for forwarding traffic in a packet-based network;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Gallo and Hawthorne with motivations such as to perform faster database look-ups (Gallo, col. 4 lines 30-31).

4.   **Claim 5 and 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Patent No.: US 6,907,469 B1 to Gallo et al. "Gallo" in view of Pub. : No.: US

2003/0152075 A1 to Hawthorne III *et al.*, "Hawthorne" as applied to claim 5 above, and

further in view of Patent No.: US 6574240 B1 to Tzeng, "Tzeng".

As to **claim 5** Gallo and Hawthorne disclose the configurable lookup table

system of claim 4;

Gallo and Hawthorne do not expressly disclose the Layer 3 lookup includes an

Internet Protocol (IP) address lookup;

Tzeng discloses a layer 3 switch logic which does IP address lookup (*fig, 4 and

fig 6, col. 7 lines 46-52*);

Gallo, Hawthorne and Tzeng are analogous art because they are from the same

field of endeavor with respect to techniques for forwarding traffic in a packet-based

network;

At the time of the invention, it would have been obvious to a person of ordinary

skilled in the art to combine the teachings of Gallo, Hawthorne and Tzeng with

motivations such as to perform L3 and L2 switching for 100 Mbps and gigabit networks

without blocking in the network switch (Tzeng, abstract).

As to **claim 13** Gallo and Hawthorne disclose the method of controlling the

lookup table system of claim 12;

Gallo and Hawthorne do not expressly disclose the Layer 3 lookup includes an

Internet Protocol (IP) address lookup;

Tzeng discloses a layer 3 switch logic which does IP address lookup (*fig, 4 and fig 6, col. 7 lines 46-52*);

Gallo, Hawthorne and Tzeng are analogous art because they are from the same field of endeavor with respect to techniques for forwarding traffic in a packet-based network;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Gallo, Hawthorne and Tzeng with motivations such as to perform L3 and L2 switching for 100 Mbps and gigabit networks without blocking in the network switch (Tzeng, abstract).

5. **Claim 8 and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Patent No.: US 6,907,469 B1 to Gallo et al. "Gallo" in view of Pub. : No.: US 2003/0152075 A1 to Hawthorne III *et al.*, "Hawthorne" as applied to claim 6 above, and further in view of Pub. No.: US 2003/0070039 A1 to Gilliangham, "Gilliangham".

As to **claim 8** Gallo and Hawthorne disclose the configurable lookup table system of claim 6;

Gallo and Hawthorne do not expressly disclose the second lookup table includes a usable entry width of at least 72-bits;

Gilliangham discloses layer 2 tables with 72-bit storage mode and Layer 3 table with 144-bit mode (pg. 1 paragraph. 4);

Gallo, Hawthorne and Gilliangham are analogous art because they are from the same field of endeavor with respect to searching data in memories;

At the time of the invention, it would have been obvious to a person of ordinary

skilled in the art to combine the teachings of Gallo, Hawthorne and Gilliangham with

motivations such as to searching variable width data words (Gilliangham, pg.1

paragraph 10).

As to **claim 14** Gallo and Hawthorne disclose the method of controlling the

lookup table system of claim 9;

Gallo and Hawthorne do not expressly disclose the second lookup table includes

a usable entry width of at least 72-bits;

Gilliangham discloses layer 2 tables with 72-bit storage mode and Layer 3 table

with 144-bit mode (pg. 1 paragraph. 4);

Gallo, Hawthorne and Gilliangham are analogous art because they are from the

same field of endeavor with respect to searching data in memories;

At the time of the invention, it would have been obvious to a person of ordinary

skilled in the art to combine the teachings of Gallo, Hawthorne and Gilliangham with

motivations such as to searching variable width data words (Gilliangham, pg.1

paragraph 10).

6.   **Claim 15 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable

over Patent No.: US 6,907,469 B1 to Gallo et al. "Gallo" in view of Pub. : No.: US

2003/0152075 A1 to Hawthorne III *et al.*, "Hawthorne" as applied to claim 9 and 18

above, and further in view of Patent No.: US 7,015,921 B1 to Trivedi et al, "Trivedi".

As to **claim 15** Gallo and Hawthorne disclose the method of controlling the lookup table system of claim 9;

Gallo does not expressly disclose the splitting the first type lookup into the first level and the second level includes configuring for a parallel operation.

Trivedi discloses a data processing system which execute parallel processing of look-up tables (col. 42 lines 25-40).

Gallo, Hawthorne and Trivedi are analogous art because they are from the same field of endeavor with respect to searching data in memories;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Gallo, Hawthorne and Trivedi with motivations such as to have a efficient method for variable length decoding bit streams (Trivedi, col. 8 lines 30-32).

As to **claim 19** Gallo and Hawthorne disclose means for controlling the lookup table of claim 18;

Gallo does not expressly disclose the means for splitting the first type lookup into the first level and the second level includes means for configuring for a parallel operation.

Trivedi discloses a data processing system which execute parallel processing of look-up tables (col. 42 lines 25-40).

Gallo, Hawthorne and Trivedi are analogous art because they are from the same field of endeavor with respect to searching data in memories;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Gallo, Hawthorne and Trivedi with motivations such as to have a efficient method for variable length decoding bit streams (Trivedi, col. 8 lines 30-32).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Louis Bell whose telephone number is 571-270-3312. The examiner can normally be reached on Monday-Friday 7:30 a.m. to 5:30 p.m..
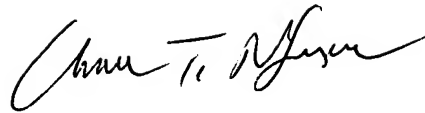
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on 571-272-3126. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LB/

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